

## REMARKS

In the patent application, claims 1-32 are pending. In the office action, all pending claims are rejected.

Applicant has amended claims 1, 2, 4, 5, 8-11, 13, 15-17, 20-25, 27, 29 and 31, cancelled claims 3, 6, 12, 14, 18, 19, 26, 28, 30 and 32, and added new claims 34-37.

Claim 1 has been amended to include the limitation that the client is ensured to play out the packet stream without buffer violation when the packet stream received at a client is transmitted over a constant delay transmission channel, that the parameters of a jitter buffer are estimated based on packet stream transfer delay variation, and that the information indicative of an aggregate of pre-decoder buffer parameters and the jitter buffer is transmitted to the server.

The support for the amendment can be found on p.4, lines 21-25 and p.9, lines 12-15 of the specification.

Claims 2, 4, 8, 9, 10, 11, 16, 17, 20, 22, 23, 24, 25 and 31 have been amended to change the wording of the claims.

Claim 5 has been amended to include the limitation that the packet stream transfer delay variation is estimated, that the parameters of jitter buffer are determined based on the estimated packet stream transfer delay variation during the streaming session, and that an aggregate of the pre-decoder buffering parameters and the changed jitter buffer is transmitted.

The support for the amendment can be found in the original claim 5 and on p.2, lines 19-21.

Claim 13 has been amended to include the limitations that the streaming client has a pre-decoder buffer for storing a packet stream, a media decoder for decoding the packet stream; a buffer controller for estimating parameters of a jitter buffer based on packet stream transfer delay variation; and a signaling engine for receiving from the server pre-decoder buffer parameters to ensure that the client is able to play out the packet stream without buffer violation when the packet stream is transmitted over a constant delay, reliable transmission channel, and for providing information indicative of an aggregate of the pre-decoder buffering parameters and the jitter buffer to the server.

The support for the amendment can be found on Figure 1 (blocks 70, 84, 90, 110); p.9, lines 10-31 of the specification.

Claim 15 has been amended to include the limitation of a post-decoder buffer for storing media data after decoding.

The support for amendment can be found on Figure 1 (block 100); p.9, lines 24-27 of the specification.

Claim 21 has been amended to include the limitations that the buffer controller is adapted for estimating the packet stream transfer delay variation and further adapted for determining parameters of the jitter buffer based on the estimated packet stream transfer delay variation; and the signaling engine is further adapted to provide the aggregate of the pre-decoder buffering parameters and the changed jitter buffer during a streaming session.

The support for the amendment can be found in claim 5.

Claim 27 has been amended to include the limitation that the streaming server has a signaling engine for transmitting pre-decoder buffer parameters to ensure the client is able to play out the packet stream without buffer violation when the packet stream is transmitted over a constant delay, reliable transmission channel and for receiving information indicative of an aggregate of the client's pre-decoder buffering parameters and a jitter buffer.

The support for the amendment can be found on Figure 1 (block 20); p8, lines 18-20; and p.9, line 29 to p.10, line 4 of the specification.

Claim 29 has been amended to include the further limitation of a rate controller adapted to adjust a rate at which media data is transmitted from the server in accordance with the aggregate buffering parameters.

The support for the amendment can be found on Figure 1 (block 30); p.8, lines 26-30 of the specification.

New claim 33 is dependent from claim 29 and has the further limitation that the information indicative of the aggregate buffering parameters is received during a streaming session; and the rate

controller is adapted to re-adjust the rate at which media data is transmitted from the server in accordance with the changed aggregate buffering parameters.

The support can be found on p.8, lines 26-30 of the specification.

New claim 34 has the limitations of transmitting to the client pre-decoder buffering parameters to ensure the client is able to play out the packet stream without buffer violation when the packet stream is transmitted over a constant-delay, reliable transmission channel and receiving information indicative of an aggregate of the client's buffering parameters and a jitter buffer.

The support can be found in claim 29.

New claim 35 is dependent from claim 34 and includes the further limitation that the information indicative of the aggregate buffering parameters received by the server includes at least one of the information regarding a size of the client's pre-decoder buffer, information regarding a pre-decoder buffering period, and information regarding a post-decoder buffering time.

The support can be found in claim 31.

New claim 36 is dependent from claim 34 and includes the further limitation of adjusting the rate at which media data is transmitted in accordance with the aggregate buffering parameters.

The support can be found in claim 29.

New claim 37 is dependent from claim 34 and includes the further limitation that the information indicative of the aggregate buffering parameters is received during a streaming session; and that the rate at which media data is transmitted is re-adjusted in accordance with a changed aggregate buffering parameters.

The support can be found in claim 33.

No new matter has been introduced.

At section 4 of the office action, claims 1-32 are rejected under 35 U.S.C. 102(e) as being anticipated by *Harumoto et al.* (U.S. Patent No. 7,016,970 B2, hereafter referred to as *Harumoto*).

It is respectfully submitted that, according to the claimed invention, the method for receiving of a packet stream at a client has the limitations of

receiving from the server pre-decoder buffering parameters to ensure that the client is able to play out the received packet stream without buffer violation when the packet stream is transmitted over a constant delay, reliable transmission channel;

estimating parameters of a jitter buffer based on packet stream transfer delay variation; and transmitting to the server information indicative of an aggregate of the pre-decoding buffering parameters and the jitter buffer. *See Claim 1.*

Similarly, the method for transmitting the packet stream to the client has the limitations of transmitting to the client pre-decoder buffering parameters to ensure the client is able to play out the packet stream without buffer violation when the packet stream is transmitted over a constant-delay, reliable transmission channel; and

receiving information indicative of an aggregate of the client's buffering parameters and a jitter buffer. *See Claim 34.*

Thus, in the claimed invention of claims 1 and 34, the transmission and reception of a packet stream involves at least

(1) receiving at the client pre-decoder buffering parameters from the server to ensure that the client is able to play out the received packet stream without buffer violation when the packet stream is transmitted over a constant delay, reliable transmission channel; and

(2) transmitting from the client to the server information indicative of an aggregate of the pre-decoding buffering parameters and the jitter buffer, wherein the parameters of the jitter buffer are estimated based on packet stream transfer delay variation.

*Harumoto* does not disclose those limitations.

*Harumoto* is concerned with a method wherein the client (terminal) notifies a server of a target value and a delay time as determined by the client, allowing the server to control the transmission speed so that the buffer occupancy of the client changes in the vicinity of the target value without exceeding the target value. In particular, the target value is the value of stream data to be stored in the receiver buffer determined based on the entire capacity of the buffer (col.11, lines 9-15). The delay time ( $T_{\text{delay}}$ ) is indicative of the period between the time the client writes a head

data of the stream data to the buffer, read the data and start decoding or playing (col. 11, lines 18-20; abstract).

According to *Harumoto*, the client provides to the server a delay time ( $T_{delay}$ ), whereas, in the claimed invention, the client provides to the server an aggregate of pre-decoder buffering parameters and the jitter buffer.

The delay time ( $T_{delay}$ ), according to the *Harumoto*, is different from the jitter buffer of the claimed invention in that  $T_{delay}$  is the period between the time the client writes a head data of the stream data to the buffer, read the data and start decoding or playing, whereas the jitter buffer parameters are estimated from the estimated based on packet stream transfer delay variation.  $T_{delay}$  is a known quality dependent upon the writing and reading software and hardware in the client. It is not dependent upon packet stream transfer delay variation.

Furthermore, the pre-decoder buffer parameters is received from the server. *Harumoto* does not disclose or even suggest that the server transmitting to the server pre-decoder buffering parameters to ensure that the client is able to play out the received packet stream without buffer violation when the packet stream is transmitted over a constant delay, reliable transmission channel.

For the above reasons, *Harumoto* fails to anticipate independent claims 1 and 34.

For the same reasons, *Harumoto* fails to anticipate independent claims 13 and 27.

As for claims 2, 4, 5, 7-11, 15-17, 20-25, 29, 31, 33 and 35-37, they are dependent from claims 1, 13, 27 and 34 and recited features not recited in claims 1, 13, 27 and 34. For reasons regarding claims 1, 13, 27 and 34, *Harumoto* also fails to anticipate claims 2, 4, 5, 7-11, 15-17, 20-25, 29, 31, 33 and 35-37.

## CONCLUSION

Claims 1, 2, 4, 5, 7-11, 13, 15-17, 20-25, 27, 29, 31, 33-37 are allowable. Early allowance of all pending claims is earnestly solicited.

Respectfully submitted,



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